

# THE ADVANCE PROGRAM AT THE UNIVERSITY OF PUERTO RICO AT HUMACAO

*Idalia Ramos<sup>1</sup>, Beatriz Hernández<sup>2</sup> and Edwin Díaz<sup>3</sup>*

**Abstract** — *The University of Puerto Rico at Humacao is an undergraduate institution with strong programs in applied science and mathematics. In 2001 we were awarded an NSF ADVANCE Institutional Grant to increase the advancement of women faculty in science. The program is implementing the following activities: research support for participants; a mentoring program for women faculty; research to understand the causes of the high participation of women students in science to develop strategies that can be used by other institutions; collection of baseline data on the status of women faculty; training for faculty on gender related issues and how to advance in academic positions; training for administrators as to improve gender equality and diversity; procedure revision to recruit and promote women, development and implementation of an Action Plan to increase the participation and advancement of women faculty. A multidisciplinary Coordinating Committee is collaborating toward the implementation and promotion of the program.*

**Index Terms** — *ADVANCE, Faculty, Mentoring, Research*

## Introduction

The University of Puerto Rico (UPR) is a public higher education institution with approximately 60,000 undergraduate and graduate students and 11 campuses. The Humacao Campus (UPRH) is located in the South East of the island. UPRH is an undergraduate institution with 4,300 students and 350 faculty members. It is known for its undergraduate programs in applied science and mathematics: Marine Biology, Wild Life Management, Microbiology, Industrial Chemistry, Physics Applied to Electronics, and Computational Mathematics. These programs were established in the seventies and eighties with the objective of training scientists and technicians for the electronics and pharmaceuticals industries of the region. The percentage of women in science at UPRH is 68% students and 39% faculty. Other campuses of the UPR have similar percentages of women.

Figure 1 shows the percentages of women in science (students and faculty) in the science departments at UPRH in 2002. The number of women students is 1024 and 104 in the faculty. The Social Sciences, Biology, and Chemistry programs have 73%, 72% y 67%, of women students, respectively. In Computational Mathematics the number of female students is comparable to the number of male students. The Physics and Electronics department has the lowest participation, 27%. This is the only Department with a program to recruit and retain women students and the percentage is the result of this effort.

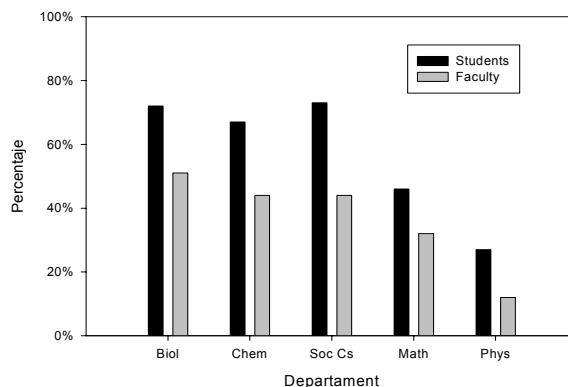


FIGURE 1: Women in Science Departments at UPR-Humacao

In every science department shown in Figure 1 we observe a reduction in the participation of women in the faculty; the number of women in the faculty is small if we consider the potential pool for recruitment.

For years different efforts were made at UPRH to improve the status of women and the status of women in science. All these efforts have converged after we were awarded an NSF ADVANCE Institutional Transformation Grant in 2001.

<sup>1</sup> Idalia Ramos, PI ADVANCE Program, Associate Professor Physics and Electronics, University of Puerto Rico at Humacao, CUH Station, Humacao, PR, 00791, (787) 850-9381, iramos@cuhwww.upr.clu.edu

<sup>2</sup> Beatriz Hernández, ADVANCE Program, University of Puerto Rico at Humacao, CUH Station, Humacao, PR, 00791, (787) 850-0000 ext. 9629, b\_hernandez@webmail.uprh.edu

<sup>3</sup> Edwin Díaz, ADVANCE Program, University of Puerto Rico at Humacao, CUH Station, Humacao, PR, 00791, (787) 850-0000 ext. 9629, my952153@rrpac.upr.clu.edu

In this paper we will present baseline data about women in the science faculty at UPRH, the barriers that prevent women faculty from advancing, and the progress to date of our ADVANCE Program.

## Women in the Science Faculty at UPRH

Figure 2 shows the distribution of science faculty by department and gender. The percentages are based on the total number of science faculty, and illustrate the relationship between departmental sizes. The Mathematics and Physics departments show the largest disparities between male and female faculty.

In figure 3 we can observe the distribution of faculty by their highest academic degree. The percentage of male faculty with a PhD is 54% versus 45% for female faculty (40 male and 18 female). The lack of a PhD is one of the barriers for women advancement, but not the only or most significant one.

Figure 4 shows the distribution of science faculty by gender and academic position. The percentage of male faculty with full professorship is 33% versus 31% for female (24 male and 12 female). At UPRH a faculty with a PhD and an active research project can be promoted to a full professorship in less than 10 years. A higher proportion of men reach that position early in their careers while women wait longer to be promoted. Currently, in the Departments of Mathematics and Physics there are no women with full professorships (Physics never has had a female Full Professor).

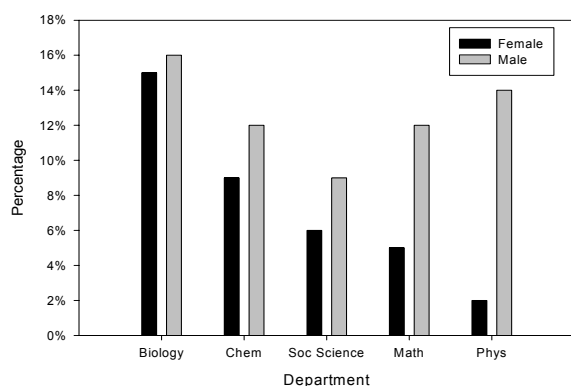


FIGURE 2: Faculty by Gender in Science Departments at UPRH

Salaries for faculty in Puerto Rico tend to be lower than in the US mainland. At UPRH salaries are based on a fixed scale that considers academic degree, rank, and years in the position. There is a higher scale for Physicians, Architects, Lawyers and Engineers. To promote productivity, several years ago UPRH approved a salary bonus for publications

and for attracting external research funds. Of 12 faculty who had a salary bonus in 2001 only 3 were female.

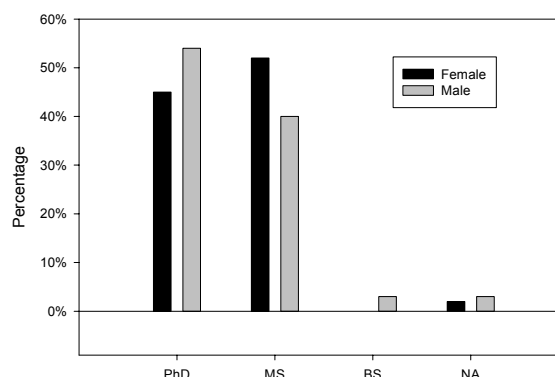


FIGURE 3: Faculty by Gender and Highest Degree

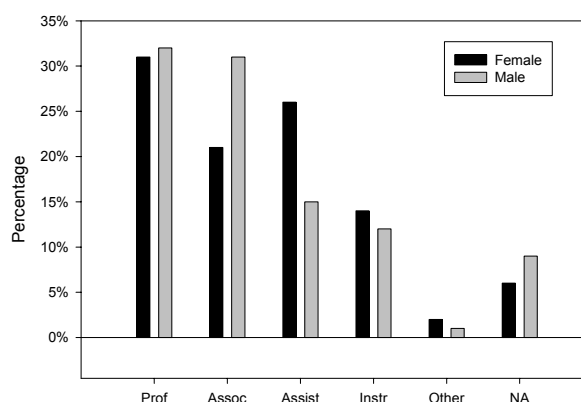


FIGURE 4: Science Faculty by Gender and Academic Rank

Figure 5 shows the distribution of science faculty salaries by gender. The percentage of women is higher in the intermediate range. In this range are those who do not have a PhD or do not qualify for the salary bonus.

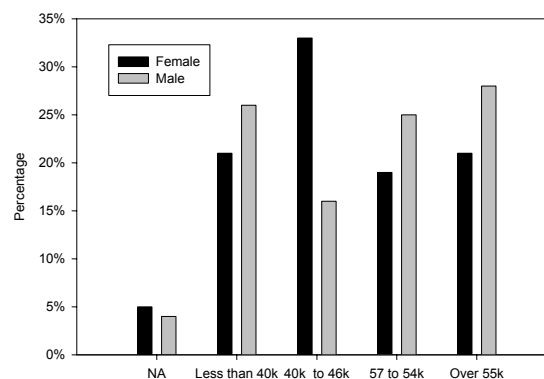


FIGURE 5: Average Annual Salaries of Science Faculty by Gender

The space assigned to faculty for research and other activities is an important measurement of status within the academic environment. Total laboratory space available for researchers at UPRH is 682m<sup>2</sup> in Biology, 262m<sup>2</sup> in Chemistry, 233m<sup>2</sup> in Physics and 69m<sup>2</sup> in Mathematics. Baseline data shows that during the academic year 2001-2002 79% of the space available for research was assigned to male faculty. Figure 6 shows the distribution of this space to faculty by gender and science department.

The space data does include the facilities used by researchers off campus like Governmental Wild Life Management and Marine Biology Laboratories, Observatories or facilities of collaborators in other universities. The use of educational laboratories for research activities has not been included either.

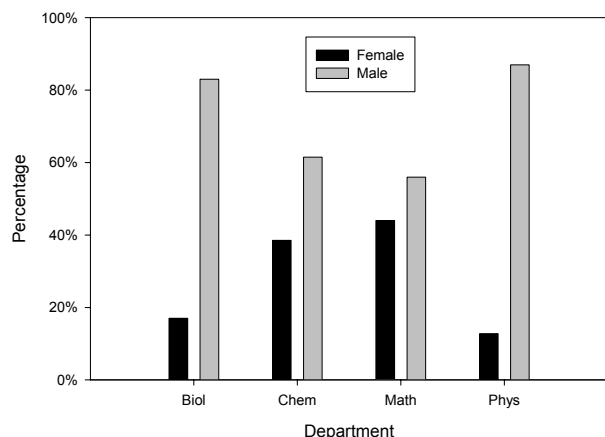


FIGURE 6: Research Space Distribution by Department and Gender

### Barriers for Women's Advancement

We have identified the following as the main barriers that prevent women in the science faculty at UPRH from advancing in the academic positions:

- Differences in academic degrees, types of contracts, promotions, salaries, space and resources between men and women.
- Conflicts between work and family.
- Isolation from current research topics and lack of collaborations.
- Excessive teaching and service responsibilities.
- Lack of negotiation skills and time management.

### Program Goals and Implementation

The main goals of UPRH's ADVANCE Program are:

- To identify problems faced by women science faculty that prevent them from advancing to higher positions in academe
- To increase the number of women science faculty with senior ranks and leadership positions in the sciences.
- To increase the number of women science faculty with active and funded research projects.

The program is implemented by a PI, Co-PI, two full time coordinators and two external evaluators in collaboration with a multidisciplinary Committee.

The Educational Coordinator is responsible for organizing educational activities and the Program's outreach. The Administrative Coordinator, in collaboration with the PI, is responsible for administration of the Program.

The Coordinating Committee provides support in their areas of expertise to the participants and the program. The Members of the Committee represent the following positions or offices: Dean of Academic Affairs, Chairs of Science Departments, Office of Human Resources, Office of Equal Opportunities; Office of External Resources, Office of Statistics, Library, Office of Academic Computing; Child Care Center, Committee on the Status of Women and Program to Prevent Violence Against Women.

### Activities and Progress to Date

In the first year and a half the ADVANCE program at UPRH has implemented the following activities:

- **Research Support:** Over 24 faculty participants have received support for research activities including release time, travel to conferences, materials for research projects and publications. Some of the projects supported are in the areas of Environmental Science, Electrochemistry, Numerical Analysis, Materials Engineering and Sociology.
- **Mentoring and Training** for participants on maintaining a successful research project; establishing collaborations; seeking external funding; writing a successful proposal; gender issues. Senior Scientists serve as mentors for new faculty.
- **Faculty Recruitment:** One woman faculty and ADVANCE participant obtained a tenure track position during the first year of the grant.
- **Visiting Scientists:** Five scientists visited UPRH to participate in conferences, research, and teaching.

- **Faculty in Training:** Four students were recruited and participate in mentoring activities and undergraduate research. They will pursue graduate studies in Applied Mathematics, Physical Oceanography and Bioengineering. Two have being admitted to graduate programs for the Fall 2003.
- **Baseline Data** collected to measure the success of the effort is being collected starting with the year 1997. The data includes: number and percentages of women in science departments; academic degrees of women hired; academic ranks and promotions; time in institution; women in top administrative positions (dean or over); women in named chairs; salaries; funds and space for research.
- **Research** to understand the high participation of undergraduate women in science at UPRH. A questionnaire was designed and administered to a sample of UPRH's science alumni. The objective is to identify why so many Puerto Rican women choose to pursue a BS in science and why they not seek graduate studies and faculty positions at the same rate.
- **Coordinating Committee** was established and collaborates with ADVANCE in the implementation and promotion of the program. They meet as a group once every semester and participate in various events during the year.
- **Revision of Rules and Protocols for Faculty Recruitment and Promotion:** a Committee designated by the Chancellor and with support from a Legal Advisor is revising the rules and protocols to develop an action plan to improve faculty diversity.
- **Semester and Annual Meetings for Participants:** for participants to present the results of their work, evaluate the efforts and plan future activities.
- **Program Evaluation:** The protocols and processes for the program evaluation were established and regular summative and formative evaluation is being performed.
- **Dissemination of Program Goals and Results:** Web Page and other promotional materials have been developed; Program promoted in local newspapers; results presented in four professional conferences; offered (by invitation) two conferences for faculty and students in other campus of UPR; meetings with faculty from three campuses of UPR interested in implementing some of our activities; presented program (by invitation) to UPR non teaching workers; ADVANCE will co-host national conference for women with participants from universities and women's groups in Puerto Rico.
- **Other Collaborators:** UPRH Faculty Association has developed a program to promote the advancement of women in non-science departments. An organization of women students in science (Feminist Laboratory) is helping to promote the program and to recruit students for faculty in training.

## ACKNOWLEDGMENT

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